

TGXR6-12 Series SF₆ Fully-Insulated and Fully-Sealed Metal-Enclosed Ring Main Unit

1 Overview



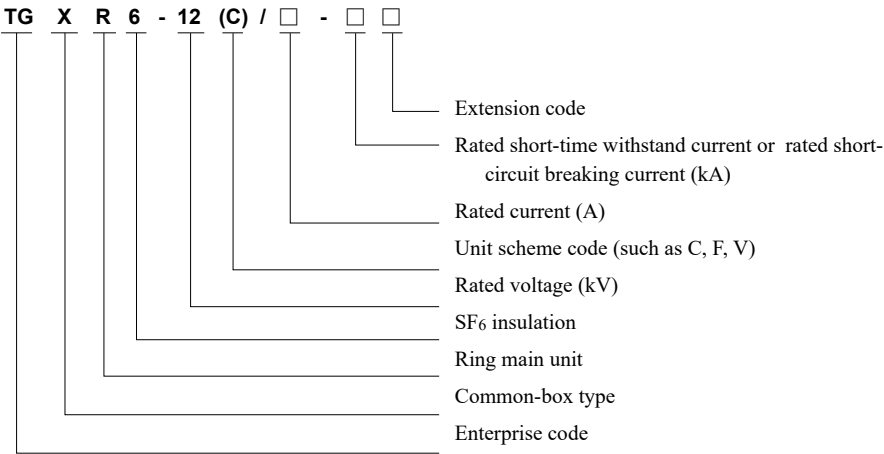
TGXR6-12 series SF₆ fully insulated and fully sealed metal-enclosed ring main unit (hereinafter referred to as "SF₆ fully insulated ring main unit") is a gas-insulated medium-voltage switchgear with three-phase AC 50Hz and rated voltage of 12kV. All live parts and switches are enclosed in a stainless-steel housing without any influence from the external environmental conditions for high reliability, safety and maintenance-free.

With modular design, SF₆ fully insulated ring main unit not only satisfies the requirements of end users and network nodes, but also meets the requirements of various distribution stations, box-type substations, and cable branch boxes., featuring with compact structure, safety and reliability, long life and maintenance-free.

SF₆ fully insulated ring main unit complies with IEC 62271, IEC 60420, GB/T 3906, and GB/T 11022 standard.



2 Type Designation



Note: N means non-extension; L means left extension; R means right extension; D means extension at both sides.

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3 Technical Parameters

Name		Unit	Load switch unit	Combined apparatus unit	Circuit breaker unit
Rated voltage		kV	12		
Rated freq.		Hz	50		
Rated current		A	630	≤125	630/1250
Rated insulation level	Power frequency withstand voltage (phase-to-phase or phase to earth)	kV	42		
	Power frequency withstand voltage(between open contacts)		48		
	Power frequency withstand voltage (control and auxiliary circuits)		2		
	Lightning impulse withstand voltage(phase-to-phase or phase to earth)		95		
	Lightning impulse withstand voltage(between open contacts)		110		
Rated short-time withstand current	Main circuit (4s/2s)	kA	20/25	—	20/25
	Earthing circuit(2s)		17.4/21.7	—	17.4/21.7
Rated peak withstand current	Main circuit	kA	50/63	—	50/63
	Earthing circuit		43.5/54.3	—	43.5/54.3
Rated short-circuit breaking current		kA	—	31.5	20/25
Rated short-circuit making current		kA	50/63	80	50/63
Rated transfer current		A	—	1600	—
Mechanical life	Load switch / circuit breaker	Times	5,000	5,000	10,000
	Disconnect switch / earthing switch	Times	3,000	3,000	3,000
Rated pressure of SF ₆ gas(relative value at 20°C)	Rated charge pressure	MPa	0.035		
	Min. functional charge pressure		0.02		
Protection grade	Cabinet body		IP4X		
	Gas box		IP67		
Annual relative leakage rate of gas		%/Y	≤0.05		

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4 Operating Conditions

- 4.1 Ambient temperature: Max. temperature: +40°C; Min. temperature: -40°C; max. daily temperature difference does not exceed 25K;
- 4.2 Altitude: ≤1,000 meters;
- 4.3 Ambient humidity: The daily mean of the relative humidity is not greater than 95%, and the monthly mean of relative humidity is not greater than 90%;
- 4.4 Pollution degree:3;
- 4.5 Electromagnetic interference: The amplitude of electromagnetic interference induced in the secondary system is ≤ 1.6 kV
- 4.6 Seismic capacity: The seismic intensity should not exceed 8 magnitude scales;
- 4.7 Installation environment: There is no explosive or corrosive gas in the ambient air.

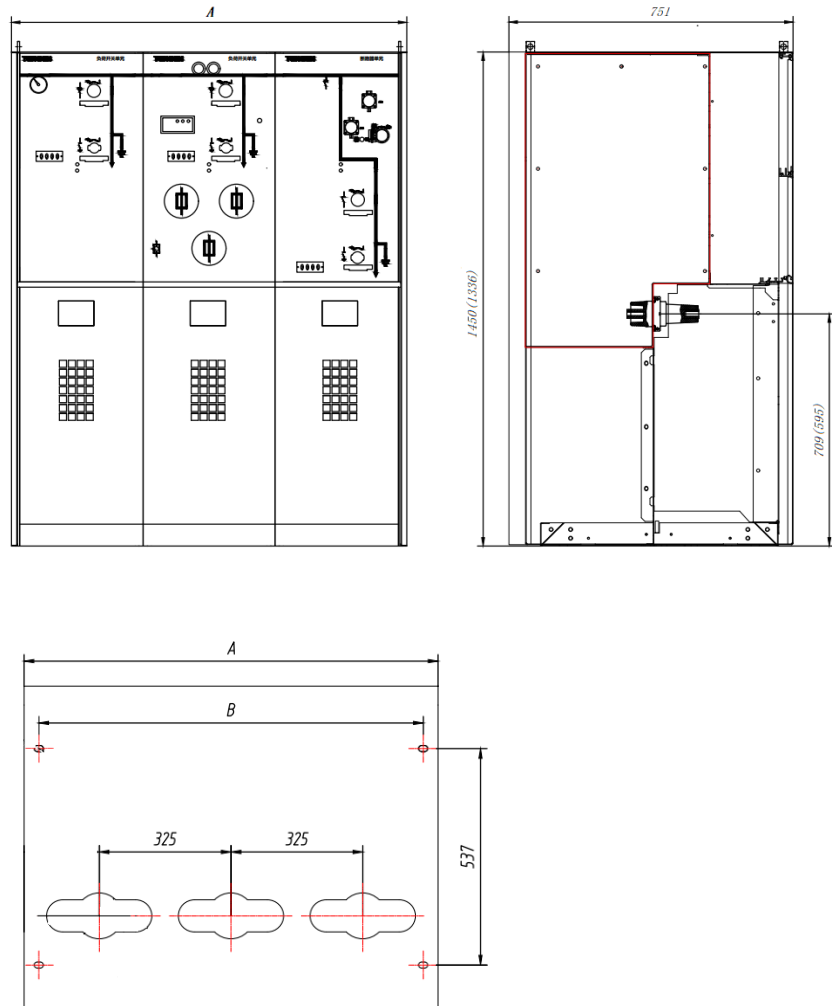
Note: Please contact the manufacturer if out of the above-mentioned working environmental conditions.

5 Features

- 5.1 Standard modular design: SF₆ full insulated ring main unit includes a load switch unit (C), load switch + fuse combined unit (F), circuit breaker unit (V), metering cabinet unit (M), and busbar PT unit. Different modules can be combined arbitrarily.
- 5.2 Fully insulated and fully sealed design: The primary live parts of the SF₆ fully insulated ring main unit are fully sealed in a sealed gas box welded by stainless steel plates, and the incoming and outgoing wires are connected through a fully insulated, fully sealed, and shielded cable connectors, with the protection grade up to IP67. The inside of gas box is not affected by the external environment, and the product can run in humid environment with high altitude, high salt spray and heavy pollution.
- 5.3 Advanced welding and sealing technology: The stainless-steel plate used in gas box is cut by laser and welded by robot to fully guarantee the processing accuracy and welding quality. The assembled gas box adopts isobaric vacuuming and helium leak detection technology to ensure that the annual relative gas leakage rate of the gas box is less than 0.05%.
- 5.4 High safety and reliability: The primary live part and switch body are sealed in the stainless steel gas box, and are connected to the outside through the bushing to prevent the direct contact with the live body; the equipment has reliable pressure release channels and pressure relief channels to ensure the personal and equipment safety in case of failure.
- 5.5 Perfect "five-prevention" design scheme: SF₆ fully insulated ring main unit is operated simply and reliably and manual and electric operations are both available. The overall structure is designed with a perfect "five-prevention" interlock design to ensure the safety of operation and usage of equipment.
- 5.6 Intelligent online monitoring and protection scheme realized: SF₆ fully insulated ring main unit can be connected with automation system through communication network to realize telecontrol, telemetry and telecommand functions of switchgear; the fault isolation, recovery and network reconfiguration of power distribution network can also be realized.

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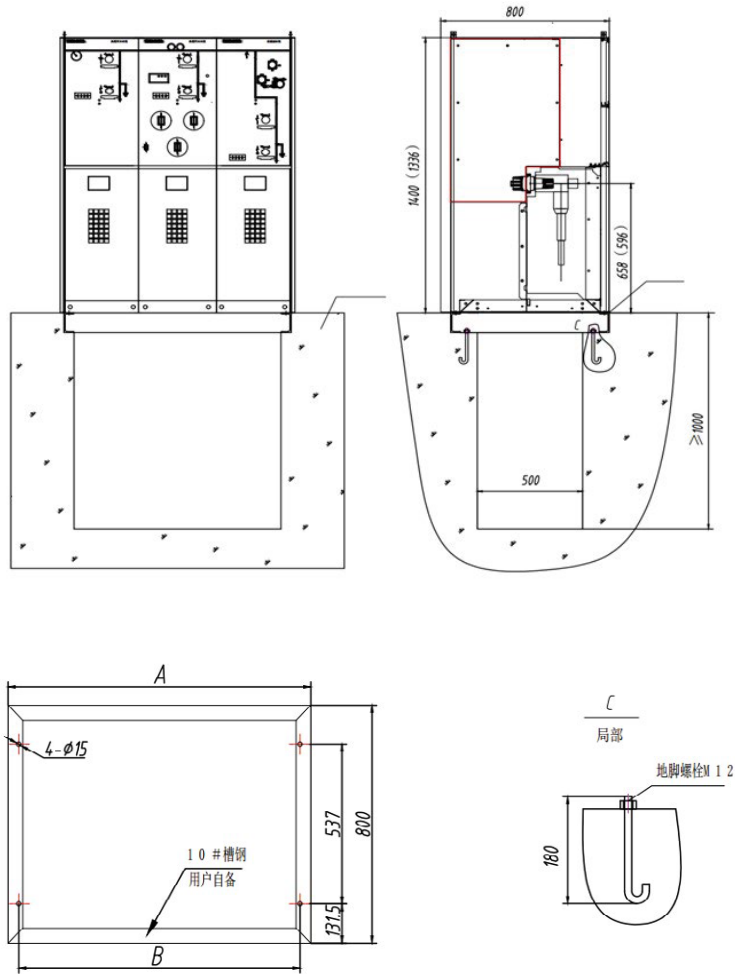
6 Outline and Installation Dimensions



Unit	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Size A (mm)	371	696	1021	1346	1671	1996
Size B (mm)	297	622	947	1272	1597	1922

Note: The baffle is widened by 325mm per one additional unit, and the dimensions in parentheses are non-standard dimensions; the instrument box of different heights can be configured as required if any.

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7 Ordering Technical Confirmation Form

Technical Confirmation Form for Ordering TGXR6-12 Series SF₆ Fully-Insulated and Fully-Sealed Metal-Enclosed Ring Main Unit

Confirm your requirements according to the items listed in table below:

Switch type	C: Load switch cabinet V: Vacuum circuit breaker cabinet F: Load switch + fuse combined cabinet <input type="checkbox"/> CCF <input type="checkbox"/> CCCF <input type="checkbox"/> CCV <input type="checkbox"/> CCCV <input type="checkbox"/> Others _____		
Cabinet layout	_____ (Arranged from the left to the right at the front of the operating panel)		
Order Qty. (unit)	Rated voltage (kV)	<input type="checkbox"/> 12	
	Rated current (A)	<input type="checkbox"/> 630 <input type="checkbox"/> Others _____	
Connector and cable accessories	<input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes (<input type="checkbox"/> heat shrink <input type="checkbox"/> cold shrink) _____ mm ² Qty.: _____	Rated short-circuit breaking current (kA)	<input type="checkbox"/> 20 <input type="checkbox"/> 25 (except for fuse)
Barometer signal contact	<input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes <input type="checkbox"/> Others _____	Door panel color	<input type="checkbox"/> RAL7035 <input type="checkbox"/> Others _____
Gas box type	Gas box type <input type="checkbox"/> Common gas box <input type="checkbox"/> Independent gas box (extended mode: <input type="checkbox"/> Top extended <input type="checkbox"/> Side extended) Others: _____		
Shell and thickness	Gas box: <input type="checkbox"/> SU201 stainless steel (standard configuration) <input type="checkbox"/> SU304 stainless steel (standard configuration) Thickness: <input type="checkbox"/> 2.0mm (standard configuration) <input type="checkbox"/> 3.0mm		
	Cabinet frame: <input type="checkbox"/> Carbon steel, plastic sprayed (standard configuration) <input type="checkbox"/> Al and zinc coated plate Thickness: <input type="checkbox"/> 1.5mm (standard configuration) <input type="checkbox"/> 2.0mm		
C load switchgear	Earthing device: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes Load switch operating mode: <input type="checkbox"/> Manual (standard configuration) <input type="checkbox"/> Electric (<input type="checkbox"/> AC/DC220 <input type="checkbox"/> DC48 Others _____) Current transformer: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes, transformation ratio _____ : _____ Capacity: _____ Accuracy: _____ (<input type="checkbox"/> Two-phase <input type="checkbox"/> Three-phase) Zero-sequence current transformer: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes, transformation ratio _____ : _____ Capacity: _____ (<input type="checkbox"/> Open type <input type="checkbox"/> Fixed type) Relay protection device: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes (<input type="checkbox"/> AC/DC220 <input type="checkbox"/> DC48 Others _____) Ammeter: <input type="checkbox"/> Pointer type (standard configuration) <input type="checkbox"/> Electronic type Temperature and humidity controller: <input type="checkbox"/> Yes _____ <input type="checkbox"/> No (standard configuration) Other options: <input type="checkbox"/> Short circuit and earth fault indicator <input type="checkbox"/> Lighting arrester <input type="checkbox"/> Lower door electromagnetic lock		
V vacuum circuit breaker cabinet	Disconnect switch: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes (Earthing <input type="checkbox"/> No <input type="checkbox"/> Yes) Operating mode: <input type="checkbox"/> Manual (standard configuration) Circuit breaker operating mode: <input type="checkbox"/> Manual (standard configuration) <input type="checkbox"/> Electric (<input type="checkbox"/> AC/DC220 <input type="checkbox"/> DC48 Others _____) Current transformer: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes, transformation ratio _____ : _____ Capacity: _____ Accuracy: _____ (<input type="checkbox"/> Two-phase <input type="checkbox"/> Three-phase)		

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V vacuum circuit breaker cabinet	Zero-sequence current transformer: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes, transformation ratio _____ : _____ Capacity: (<input type="checkbox"/> Open type <input type="checkbox"/> Fixed type) Relay protection device: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes (<input type="checkbox"/> AC/DC220 <input type="checkbox"/> DC48 Others _____) Ammeter: <input type="checkbox"/> Pointer type (standard configuration) <input type="checkbox"/> Electronic type Temperature and humidity controller: <input type="checkbox"/> Yes <input type="checkbox"/> No (standard configuration) Other option: <input type="checkbox"/> Short circuit and ground fault indicator <input type="checkbox"/> Lighting arrester <input type="checkbox"/> Lower door electromagnetic lock	
F load switch + fuse combined cabinet	Load switch: Grounding <input type="checkbox"/> No <input type="checkbox"/> Yes (standard configuration) Fuse earthing switch: <input type="checkbox"/> No <input type="checkbox"/> Yes (standard configuration) Operating mode: <input type="checkbox"/> Manual (standard configuration) <input type="checkbox"/> Electric (<input type="checkbox"/> AC/DC220 <input type="checkbox"/> DC48 Others _____) Rated current of fuse: _____ A Current transformer: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes, transformation ratio _____ : _____ Capacity: _____ Accuracy: _____ (<input type="checkbox"/> Two-phase <input type="checkbox"/> Three-phase) Zero-sequence current transformer: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes, transformation ratio _____ : _____ Capacity: (<input type="checkbox"/> Open type <input type="checkbox"/> Fixed type) Relay protection device: <input type="checkbox"/> No (standard configuration) <input type="checkbox"/> Yes (<input type="checkbox"/> AC/DC220 <input type="checkbox"/> DC48 Others _____) Ammeter: <input type="checkbox"/> Pointer type (standard configuration) <input type="checkbox"/> Electronic type Temperature and humidity controller: <input type="checkbox"/> Yes <input type="checkbox"/> No (standard configuration) Other option: <input type="checkbox"/> Short circuit and ground fault indicator <input type="checkbox"/> Lighting arrester <input type="checkbox"/> Lower door electromagnetic lock	
Dimensions	<input type="checkbox"/> Standard shape (see catalog) <input type="checkbox"/> Non-standard shape (figure attached)	
Other special requirements		<div style="text-align: center; margin-top: 100px;"> Ordering unit (Seal) </div> <div style="margin-top: 20px;"> Sign: _____ Date: _____ Tel: _____ </div>

Note: Only the basic cabinet type scheme is listed above, and those options not checked shall be produced according to the TENGGEN's standard configuration.